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**REMARKS**

By the present amendment and response, claims 1, 12, 23, 58, 70, and 71 have been amended to overcome the Examiner's objections. Claims 1-34 and 58-71 are pending in the present application. Reconsideration and allowance of pending claims 1-34 and 58-71 in view of the following remarks are requested.

The Examiner has rejected claims 1-34 and 58-71 under 35 USC §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has amended independent claims 1, 12, 23, 58, 70, and 71 to recite a substrate "having a potential" and "the pinned transfer gate being pinned to the potential of the substrate." Applicant respectfully submits that support for this amendment is found at, for example, page 6, lines 12-25 to page 7, lines 1-10 of the present application.

The Examiner has also rejected claims 1-34 and 58-71 under 35 USC §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, the Examiner has stated that "Applicant has not shown, nor is it known in the art, how to tie connect the "Pinned Transfer Gate" to the voltage of the substrate." Page 4 of the Office Action dated January 7, 2004. In response, Applicant respectfully submits that the teachings of Janesick, U.S. patent number 5,077,592, other prior art references (mentioned below), and a variety of

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patents and other references disclosing and teaching "pinned photodiodes" can be used by one of ordinary skill in the art to manufacture the pinned transfer gate disclosed in the present application.

Accordingly, Applicant respectfully submits that the requirements of 35 USC §112, first paragraph, have been met.

The Examiner has rejected claims 1 and 5-8 under 35 USC §102(e) as being anticipated by U.S. patent application publication 2002/0121656 to Robert M. Guidash to ("Guidash"). For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by amended independent claim 1, is patentably distinguishable over Guidash. However, Applicant reserves the right to provide declarations and/or documents under 37 CFR §1.131 to "swear behind" the effective filing date of Guidash.

Subject to Applicant's reserved right to establish priority of the present invention under 37 CFR §1.131, Applicant submits that the present invention, as defined by amended independent claim 1, teaches, among other things, an imager cell including a substrate "having a potential," where the imager cell comprises a pinned transfer gate "pinned to the potential of the substrate" and further being configured to transfer charge between a photoreceptor and a sense node. As disclosed in the present application, a "pinned transfer gate" is tied or pinned to the same voltage or potential as the substrate. See, for example, page 7, lines 6-7 of the present application. Thus, by utilizing a pinned transfer gate to transfer charge between a photoreceptor and a sense node, the present

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invention advantageously achieves an imager cell that does not require a transistor gate structure, which is conventionally used to transfer charge from the photoreceptor to the sense node.

As disclosed in the present application, photons incident on the photoreceptor produce electrons that are captured in an integration potential well, which is established by an integration voltage  $V+$ . As further disclosed in the present application, after the integration period, a readout potential well is established, which is shallower than the transfer potential established by the pinned transfer gate. As a result, electrons captured by the integration potential well propagate through the transfer potential well into the sense node potential well, where they (i.e. the electrons) can be read. Moreover, by employing a pinned transfer gate, which is tied to the same potential as the substrate, the present invention advantageously achieves the above readout operation without requiring a transistor gate structure.

In contrast, Guidash does not teach, disclose, or suggest an imager cell including a substrate "having a potential," where the imager cell comprises a pinned transfer gate "pinned to the potential of the substrate" and further being configured to transfer charge between a photoreceptor and a sense node. Guidash specifically discloses cell 22, which includes photodiode 12, transfer transistor 14, and sense node 24. See, for example, page 2, paragraph [0021] and Figure 2 of Guidash. In Guidash, charge is transfer from photodiode 12 to sense node 24 by transfer transistor 14. However, as clearly shown in Figure 5 of Guidash, transfer transistor 14 includes a transistor gate structure situated

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between source and drain regions 34. Thus, transfer transistor 14 cannot be a pinned transfer gate as specified by amended independent claim 1, since a pinned transfer gate does not include a transistor gate structure, as discussed above.

Additionally, in Guidash, the gate of transfer transistor 14 is not tied to the same potential as the substrate. See, for example, Figure 2 of Guidash. Instead, the gate of transfer transistor 14 would require a sufficient voltage to turn on transfer transistor 14 and allow charge transfer to occur between photodiode 12 and sense node 24.

For the foregoing reasons, Applicant respectfully submits that the present invention, as defined by amended independent claim 1, is not suggested, disclosed, or taught by Guidash. As such, the present invention, as defined by amended independent claim 1, is patentably distinguishable over Guidash. Thus claims 5-8 depending from amended independent claim 1 are, *a fortiori*, also patentably distinguishable over Guidash for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The Examiner has further rejected claims 1-6 under 35 USC §102(e) as being anticipated by U.S. patent application publication 2002/0121655 to Zheng et al. ("Zheng"). For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by amended independent claim 1, is patentably distinguishable over Zheng. However, Applicant reserves the right to provide declarations and/or documents under 37 CFR §1.131 to "swear behind" the effective filing date of Guidash.

Subject to Applicant's reserved right to establish priority of the present invention under 37 CFR §1.131, Applicant submits that Zheng fails to teach, disclose, or suggest an imager cell including a substrate "having a potential," where the imager cell comprises a pinned transfer gate "pinned to the potential of the substrate" and further being configured to transfer charge between a photoreceptor and a sense node.

With respect to Figure 1 of Zheng, a p-MOSFET transistor is used to transfer charge collected by photodiode 22. As shown in Figure 1 of Zheng, the p-MOSFET includes a transistor gate structure situated between p+ source and drain regions. Thus, since the p-MOSFET in Figure 1 includes a transistor gate structure, which must be enabled to transfer charge, the p-MOSFET in Figure 1 of Zheng cannot be a pinned transfer gate as specified in amended independent claim 1 for similar reasons as discussed above.

With respect to Figure 5 of Zheng, SIO transistor 83 includes a transistor gate structure, which must be enabled to transfer charge from photo-collection area 98 to sense node 96. Thus, for similar reasons as discussed above, SIO transistor 83 cannot be a pinned transfer gate as specified by amended independent claim 1.

Additionally, the transistor gate structures of the p-MOSFET shown in Figure 1 of Zheng and SIO transistor 83 shown in Figure 5 of Zheng are not connected to the same voltage as the substrate. For the foregoing reasons, Applicant respectfully submits that the present invention, as defined by amended independent claim 1, is not suggested, disclosed, or taught by Zheng. As such, the present invention, as defined by amended

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independent claim 1, is patentably distinguishable over Zheng. Thus claims 2-6 depending from amended independent claim 1 are, *a fortiori*, also patentably distinguishable over Zheng for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The Examiner has further rejected claims 9-11 under 35 USC §103(a) as being unpatentable over Zheng in view of U.S. patent number 5,121,214 to Turko et al. As discussed above, amended independent claim 1 is patentably distinguishable over Zheng and, as such, claims 9-11 depending from amended independent claim 1 are, *a fortiori*, also patentably distinguishable over Zheng for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The Examiner has further rejected claims 12-34 and 58-71 under 35 USC §103(a) as being unpatentable over Guidash. Applicant has amended independent claims 12, 23, 58, 70, and 71 to specify limitations analogous to those specified by amended independent claim 1. As discussed above, amended independent claim 1 is patentably distinguishable over Guidash. Thus, for similar reasons as discussed above, amended independent claims 12, 23, 58, 70, and 71 are also patentably distinguishable over Guidash and, as such, corresponding dependent claims 13-22, 24-34, and 59-69 are, *a fortiori*, also patentably distinguishable over Guidash for at least the reasons presented above and also for additional limitations contained in each dependent claim.


The Examiner has further rejected claims 12-34 and 58-71 under 35 USC §103(a) as being unpatentable over Zheng. Applicant has amended independent claims 12, 23,

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58, 70, and 71 to specify limitations analogous to those specified by amended independent claim 1. As discussed above, amended independent claim 1 is patentably distinguishable over Zheng. Thus, for similar reasons as discussed above, amended independent claims 12, 23, 58, 70, and 71 are also patentably distinguishable over Zheng and, as such, corresponding dependent claims 13-22, 24-34, and 59-69 are, *a fortiori*, patentably distinguishable over Zheng for at least the reasons presented above and also for additional limitations contained in each dependent claim.

Based on the foregoing reasons, the present invention, as defined by amended independent claims 1, 12, 23, 58, 70, and 71 and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, claims 1-34 and 58-71 pending in the present application are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early allowance of claims 1-34 and 58-71 pending in the present application is respectfully requested.

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Respectfully Submitted,  
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